REMARKS

As indicated above, this is a Preliminary Amendment filed along with the Request for Continued Examination (RCE) filed March 13, 2003.

Claims 1 and 11have been amended, and claims 20 and 21 have been added in order to more particularly point out, and distinctly claim the subject matter to which the applicants regard as their invention. The applicants respectfully submit that no new matter has been added.

In a telephone conference conducted with Examiner Shrinivas (Steven) H. RAO, the following structural arrangements of the applicants' MOSFET, as illustrated in the applicants' Figure 2, were discussed:

(1) the applicants' source electrode film 29 is contiguous (i.e., continuous), while the oxide layer 22a and the electrically insulating region 28 that are above and on the side portion of the source region 18, as illustrated in Baliga's Figure 4H are not contiguous or continuous; and

(2) the applicants' contiguous or continuous source electrode film 29 occupies the entire opening of the trench 18, as illustrated in the applicants' Figure 2.

With respect to item 2, above, it was unclear on whether reliance is to be placed on the uppermost film, which extends the entire upper surface of the device (as illustrated in Sapp's Figure 2) or the dotted-formed element that covers the entire opening of the trench (also illustrated in Sapp's Figure 2) for teaching the applicants' claimed source electrode film 29.

In view of the uncertainty on which element, in Sapp's Figure 2, should be relied on for teaching the applicants' claimed source electrode film, the applicants herein further amend independent claims 1 and 11 in the following manner:

> said source electrode film being contiguous and extending from an upper portion of said source region and a side surface of said source region; said contiguous source electrode film covering an opening of said trench in its entirety.

Moreover, the applicant have added herein independent claims 20 and 21 in order to highlight the fact that the claimed transistor includes a plurality of trenches, wherein the claimed source electrode film covers the openings of the claimed trenches in their entireties. It is respectfully submitted that the dotted-formed element in Sapp's Figure 2, if *arguendo* relied upon by the Examiner, does <u>not</u> extend from opening to opening in the plurality of trenches.

In view of the above and the claim amendments submitted herewith, as well as the claim amendments and remarks previously filed on January 23, 2003, the applicants respectfully submit that the teachings of Baliga and Sapp, singly or in combination, would still fall far short in fully meeting the applicants' claimed invention. As such, a person of ordinary skill in the art would not have found the applicants' claimed invention obvious under 35 USC 103(a) based on Baliga in view of Sapp.

Accordingly, the withdrawal of the outstanding obviousness rejection under 35 USC 103(a) based on Baliga in view of Sapp is in order, and is therefore respectfully solicited.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Version with markings to show changes made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE 09/660,439

IN THE CLAIMS:

Amend claims 1 and 11 as follows:

1. (Twice Amended) A transistor comprising[;]:

a semiconductor substrate having a semiconductor layer, a drain layer of a first conductivity type provided on said semiconductor layer and a conductive region of a second conductivity type formed by diffusing an impurity of the second conductivity type from a surface of said drain layer;

a trench provided such that it extends from a surface of said conductive region to said drain layer;

a source region of the first conductivity type provided inner surface of said conductive region and exposed on side surface of said trench;

a gate insulating film provided on the side surface of said trench, an upper part of the gate insulating film being in contact with a lower part of said source region, a bottom part being in contact with an upper part of said drain layer, and a middle part being in contact with conductive region;

a gate electrode material provided in contact with said gate insulating film in said trench;

a source [of] electrode film provided in contact with at least said source region exposed at least on the side surface of said trench and electrically insulated from said gate electrode

material, said source region being substantially square when viewed from a direction parallel to said side surface of said trench, said source electrode film being contiguous and extending from an upper portion of said source region and a side surface of said source region, said contiguous source electrode film covering an opening of said trench in its entirety.

11. (Twice Amended) A transistor comprising:

a semiconductor substrate having a drain layer of a first conductivity type and a conductive region of a second conductivity type formed by diffusing an impurity of the second conductivity type from a surface of said drain layer;

a trench provided such that it extends from a surface of said conductive region to said drain layer;

a source region of the first conductivity type provided in inner surface of said conductive region and exposed on side surface of said trench;

a gate insulating film provided on the side surface of said trench, an upper part of the gate insulating film being in contact with a lower part of said source region, a bottom part being in contact with an upper part of said drain layer, and a middle part being in contact with said conductive region;

a gate electrode material provided in contact with said gate insulating film in said trench;

a source electrode film provided in contact with said source region exposed at least on the side surface of said trench and electrically insulated from said gate electrode material, said source

electrode film being contiguous and extending from an upper portion of said source region and a side surface of said source region, said contiguous source electrode film covering an opening of said trench in its entirety,

said source region being substantially square when viewed from a direction parallel to said side surface of said trench; and

a metal film formed on a surface of said drain layer opposite to said conductive region to establish Schottky contact with said drain layer.

Add claims 20 and 21 as follows:

20. A transistor comprising:

a semiconductor substrate having a semiconductor layer, a drain layer of a first conductivity type provided on said semiconductor layer and a conductive region of a second conductivity type formed by diffusing an impurity of the second conductivity type from a surface of said drain layer;

a plurality of trenches, each of said plurality of trenches being provided such that it extends from a surface of said conductive region to said drain layer;

a source region of the first conductivity type provided inner surface of said conductive region and exposed on side surface of said trench;

a gate insulating film provided on the side surface of said trench, an upper part of the gate

insulating film being in contact with a lower part of said source region, a bottom part being in contact with an upper part of said drain layer, and a middle part being in contact with conductive region;

a gate electrode material provided in contact with said gate insulating film in said trench;

a source electrode film provided in contact with at least said source region exposed at least on the side surface of said trench and electrically insulated from said gate electrode material, said source region being substantially square when viewed from a direction parallel to said side surface of said trench, said source electrode film being contiguous and extending from an upper portion of said source region and a side surface of said source region, said contiguous source electrode film covering a plurality of openings of said trenches in their entireties.

21. A transistor comprising:

a semiconductor substrate having a drain layer of a first conductivity type and a conductive region of a second conductivity type formed by diffusing an impurity of the second conductivity type from a surface of said drain layer;

a plurality of trenches, each of said plurality of trenches being provided such that it extends from a surface of said conductive region to said drain layer;

a source region of the first conductivity type provided in inner surface of said conductive region and exposed on side surface of said trench;

a gate insulating film provided on the side surface of said trench, an upper part of the gate insulating film being in contact with a lower part of said source region, a bottom part being in contact with an upper part of said drain layer, and a middle part being in contact with said conductive region;

a gate electrode material provided in contact with said gate insulating film in said trench;

a source electrode film provided in contact with said source region exposed at least on the side surface of said trench and electrically insulated from said gate electrode material, said source electrode film being contiguous and extending from an upper portion of said source region and a side surface of said source region, said contiguous source electrode film covering a plurality of openings of said trenches in their entireties,

said source region being substantially square when viewed from a direction parallel to said side surface of said trench; and

a metal film formed on a surface of said drain layer opposite to said conductive region to establish Schottky contact with said drain layer.